MDR-NC20

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model
E Model
Tourist Model

SPECIFICATIONS

General

Type	Dynamic, closed
Driver units	30 mm dia: dome type
Impedance	24 ohms at 1 kHz (when the power is on) 56 ohms at 1 kHz (when the power is off)
Sensitivity	99 dB/mW (when the power is on) 98 dB/mW (when the power is off)
Frequency response	16 – 22,000 Hz
Frequency range of active noise attenuation	40 – 1,500 Hz more than 10 dB at 300 Hz
Input cord	0.5 m cord with a gold-plated microplug
Power source	DC 1.5 V, 1 × R03 (size AAA) battery
Mass	Approx. 175 g (6.2 oz) including battery

Supplied accessories

Connecting cord 1m (39 3/8 in.) (a gold-plated micro jack → a gold-plated L shaped stereo mini plug) (1)
Plug adaptor for in-flight use (single/dual) (1)
Carrying case (1)
Operating instructions (1)

Design and specifications are subject to change without notice.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

NOISE CANCELING STEREO HEADPHONES

SONY®

SECTION 1
GENERAL

This section is extracted from instruction manual.

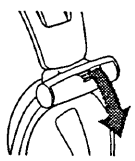
Features

- Noise canceling headphones reduce ambient noise, and provide a quieter environment to enhance audio entertainment. Ambient sound is synthesized with an anti-sound signal produced by the noise canceling circuit, and reduced. (Over 10 dB is reduced at 300 Hz.)
- Compact folding Style
- Neodymium magnets are used to deliver powerful sound.
- Operates as passive headphone when noise canceling circuit is not activated.
- Plug adaptor is supplied to connect directly to stereo or dual jack of inflight music services.
- Plug types are compatible with Sony WALKMAN*, Discman or MD WALKMAN remote controllers and stereo mini jacks of audio and visual equipment.

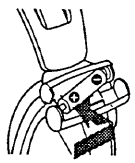
* WALKMAN is a registered trademark of Sony Corporation.

Installing a battery

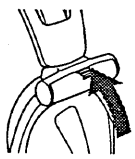
1 Open the lid of the battery box on the right outer side of the headphone.



2 Insert one R03 (size AAA) battery by matching the + and – on the battery to the + and – in the battery box.

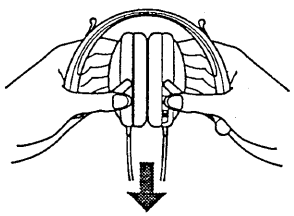


3 Close the lid.

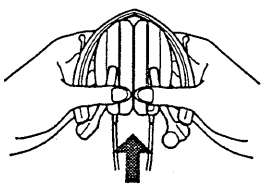


Folding and unfolding the headphones

Unfolding



Folding



Battery life

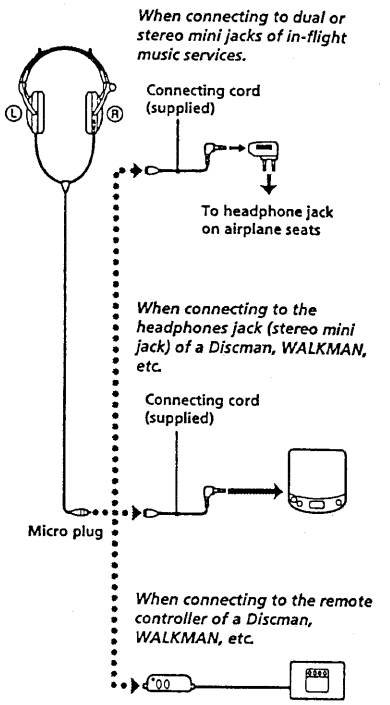
Battery	Approx. hours
Sony alkaline battery LR03/ AM-4 (N)	45 hours
Sony battery R03/UM-4 (NU)	23 hours

When to replace the battery

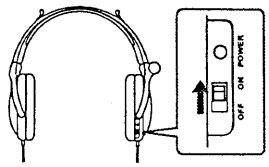
Replace the battery with a new one when the POWER indicator dims.

Listening to music

1 Connect the headphones to the AV equipment.


When connecting to dual or stereo mini jacks of in-flight music services.
Connecting cord (supplied)
To headphone jack on airplane seats
When connecting to the headphones jack (stereo mini jack) of a Discman, WALKMAN, etc.
Connecting cord (supplied)
Micro plug
When connecting to the remote controller of a Discman, WALKMAN, etc.

2 Turn on the power of the headphones.
The power indicator lights in red. When the power is turned on, ambient noise is reduced, and you can listen to music more clearly at a lower volume.

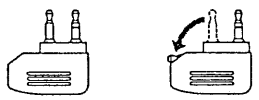


3 Put on the headphones so that the ear pads cover your ears.

4 Turn on the power of the AV equipment.

Notes on using on the airplane

- The supplied plug adaptor can be connected to dual and stereo mini jacks.



- Do not use the headphones when use of electronic equipment is prohibited or when use of personal headphones for inflight music services is prohibited.

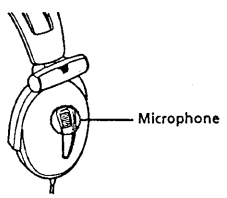
If you have any questions or problems concerning the system that are not covered in this manual, please consult the nearest Sony dealer.

After listening to music

Turn off the power of the headphones.

Notes

- The noise canceling function is only effective for noise in the low frequency band. Although noise is reduced, it is not canceled completely.
- Do not cover the microphone of the headphones with your hands. The noise canceling function may not work properly.



- The noise canceling function may not work properly unless the headphones are put on firmly.
- You can use the headphones without turning on the power. In this case, the noise canceling function is not active, and the headphones operate as passive headphones.

Precautions

- Clean the headphones with a soft dry cloth.
- Do not leave the plug dirty otherwise the sound may be distorted.
- Be sure to bring the headphones to a Sony dealer when requiring a change of ear pads or repair work.
- The CE mark on the unit is valid only for products marketed in the European Union.
- Do not leave the stereo headphones in a location subject to direct sunlight, heat or moisture.

Notes on headphones

Preventing hearing damage

Avoid using headphones at high volume. Hearing experts advise against continuous, loud and extended play. If you experience a ringing in your ears, reduce the volume or discontinue use.

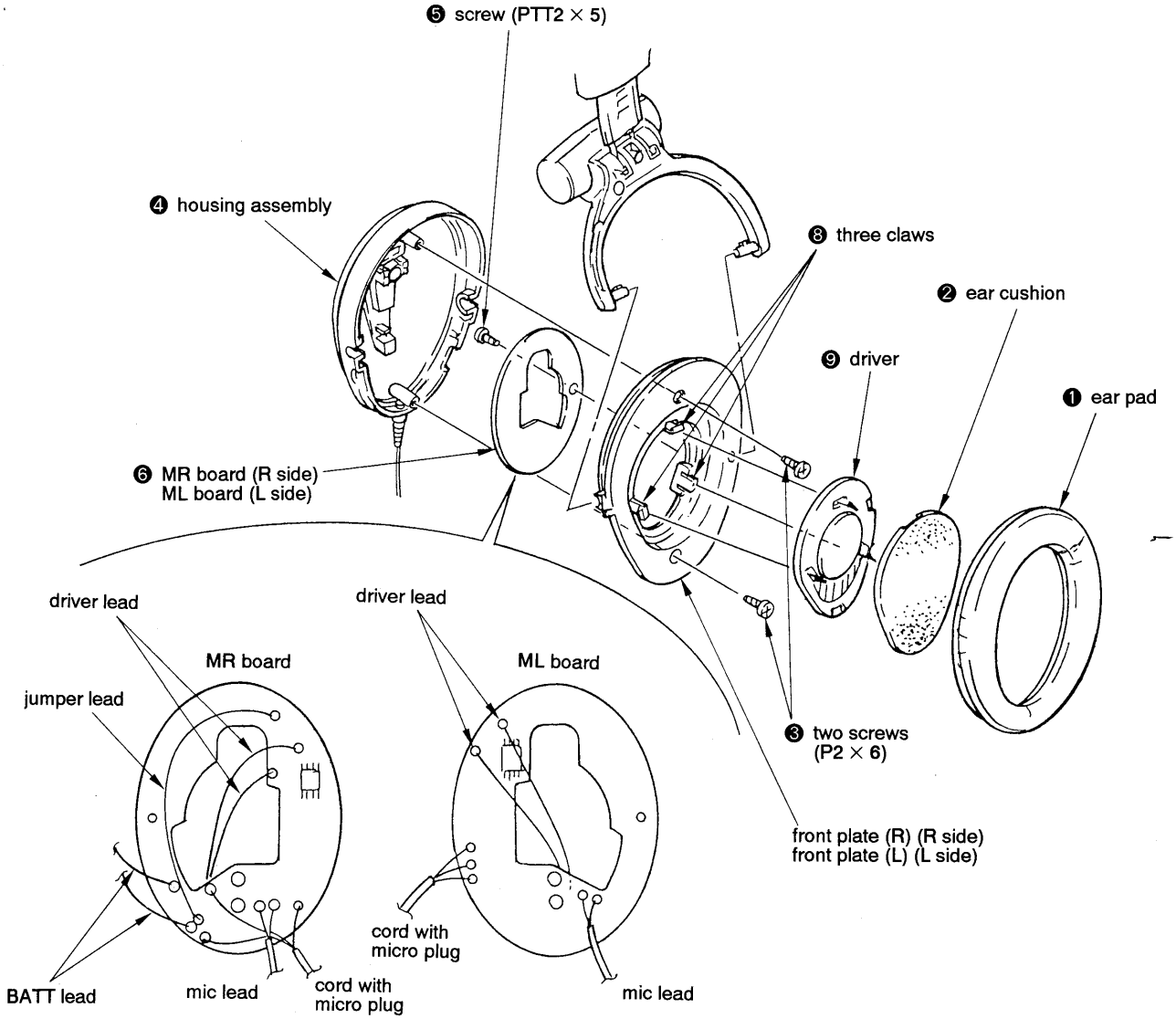
Do not listen with the headphones while driving or cycling

As your headphones reduce outside sounds, it may cause traffic accident. Also avoid using them where hearing must not be impaired, for example, a railroad crossing, a site of construction, etc.

SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

DRIVER

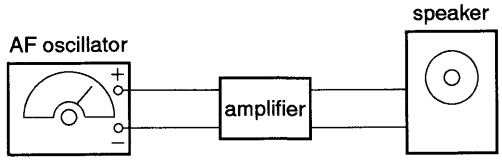


❼ Disconnect each wiring of the MR board and ML board.
Note: Take care not to cut lead wires.

SECTION 3
ELECTRICAL ADJUSTMENT

NOISE CANCELING AMOUNT ADJUSTMENT

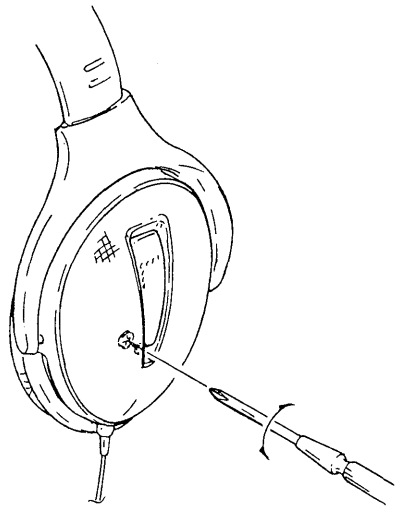
Preparation:



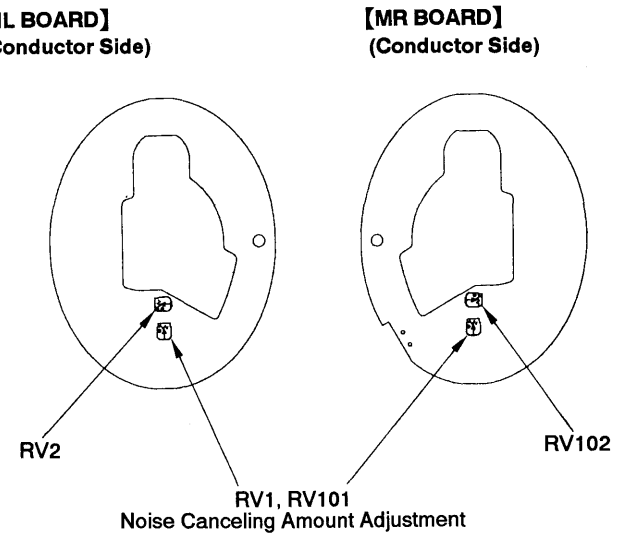
Procedure:

1. Generate a sine wave of specific frequency (250 Hz) from a AF oscillator, and output it from a speaker placed at the forward position.
2. Mount this set on the head, and turn on the POWER switch.
3. With this set mounted, rotate the RV1 (Lch) and RV101 (Rch) so that the volume from the speaker becomes lowest aurally. (See right figure)

Caution: Do not rotate the RV2 (Lch) and RV102 (Rch) because the sensitivity adjustment is not performed.
If they were rotated, adjust them to the mechanical center.



Adjustment Location:

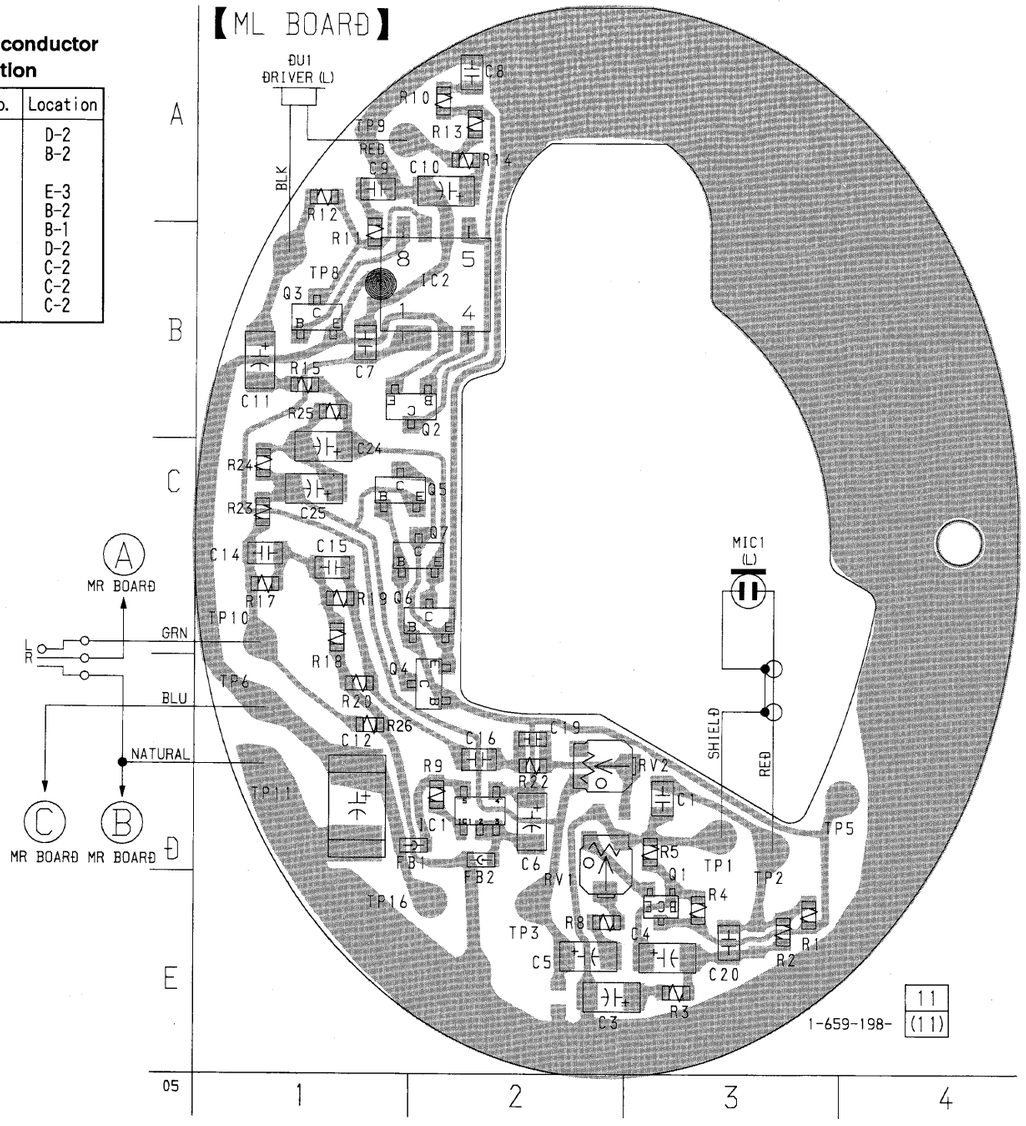


SECTION 4
DIAGRAMS

4-1. PRINTED WIRING BOARDS

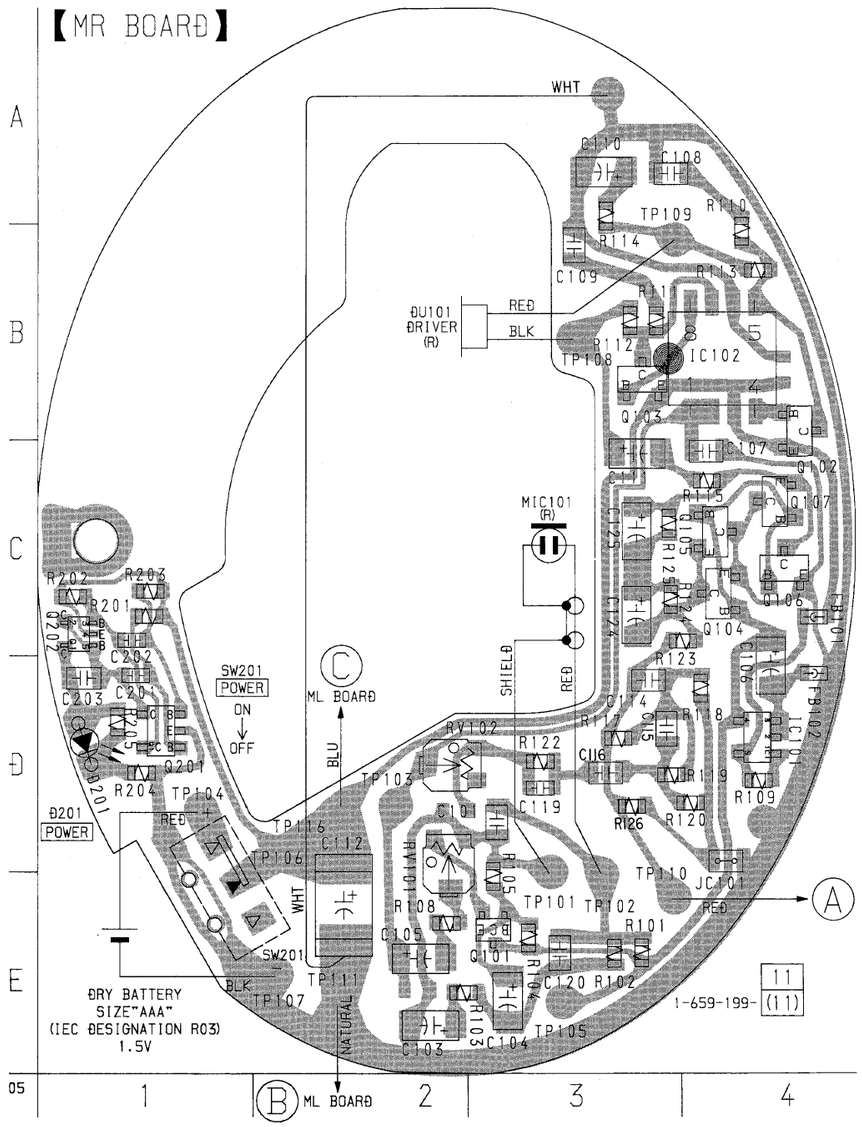
- **Semiconductor Location**

Ref. No.	Location
IC1	D-2
IC2	B-2
Q1	E-3
Q2	B-2
Q3	B-1
Q4	D-2
Q5	C-2
Q6	C-2
Q7	C-2



- **Semiconductor Location**

Ref. No.	Location
D201	D-1
IC101	D-4
IC102	B-4
Q101	E-3
Q102	B-4
Q103	B-3
Q104	C-4
Q105	C-4
Q106	C-4
Q107	C-4
Q201	D-1
Q202	C-1



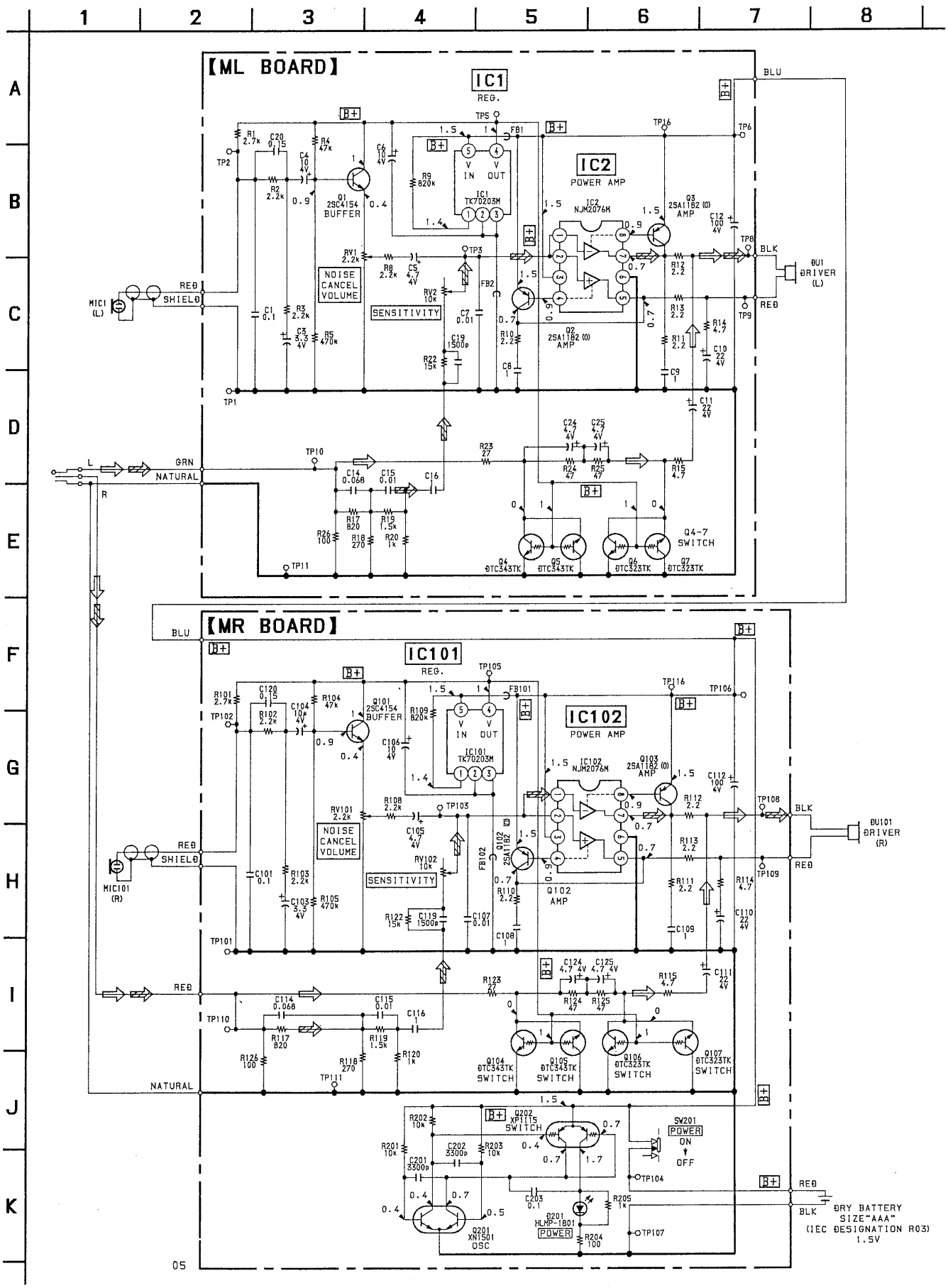
Note on Printed Wiring Boards:

- ——— : parts extracted from the conductor side.

Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- ▭ : panel designation.
- **B +** : B + Line.
- ▬ : adjustment for repair.
- Power voltage is dc 1.5 V and fed with regulated dc power supply from the battery terminal.
- Voltages are dc with respect to ground under no-signal conditions.
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  - ⇨ : AUDIO signal (POWER OFF)
  - ⇨ : AUDIO signal (POWER ON)

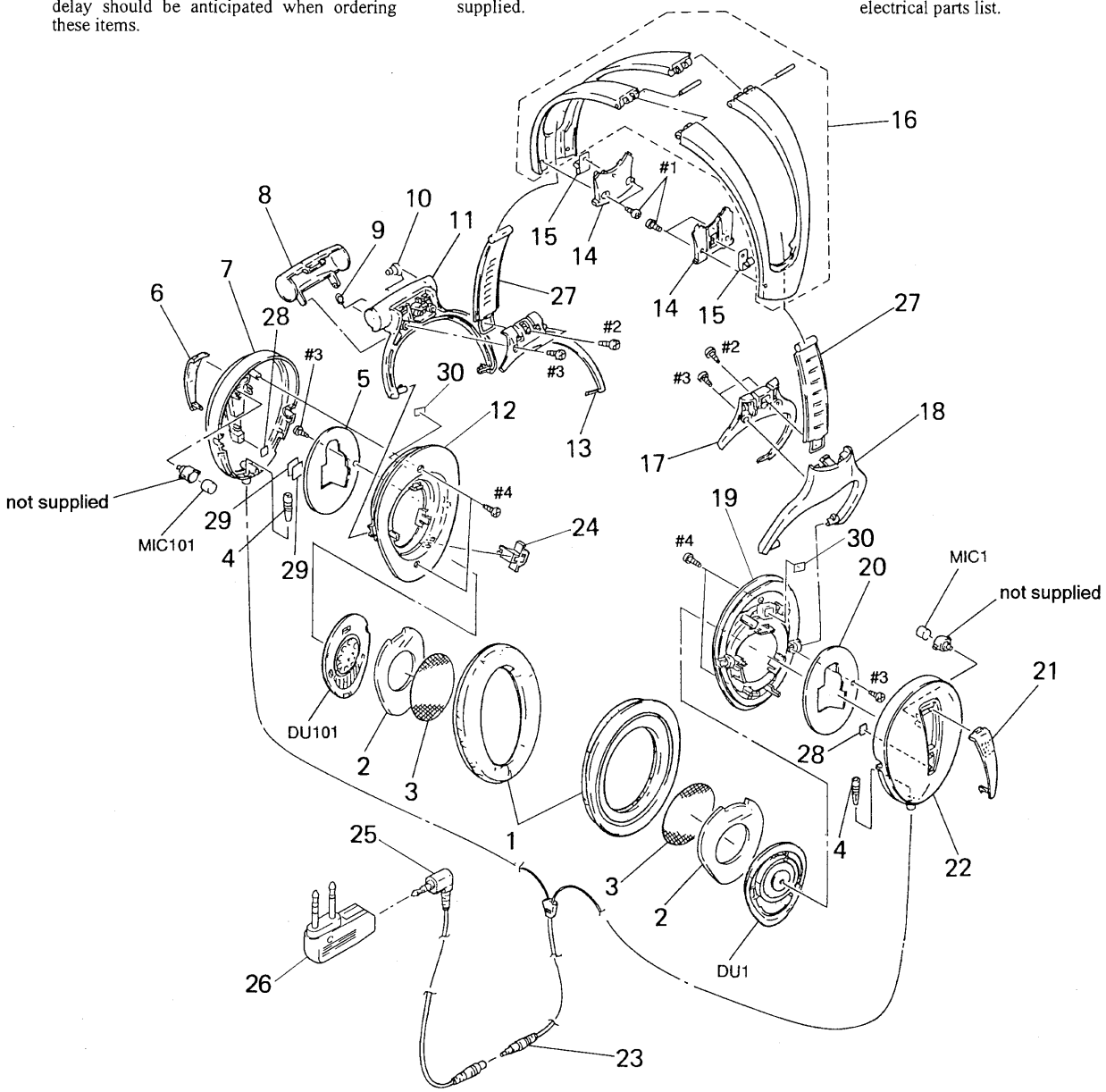
4-2. SCHEMATIC DIAGRAM



SECTION 5
EXPLODED VIEW

NOTE:

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of the electrical parts list.



Ref. No.	Part No.	Description	Remark
1	4-978-893-01	PAD, EAR	
2	4-979-588-02	CUSHION, EAR	
3	4-981-185-01	LAMINATE	
4	2-297-614-11	BUSHING	
* 5	A-4542-350-A	MR BOARD, COMPLETE	
6	4-978-888-11	CAP, ORNAMENTAL	
7	X-4946-573-1	HOUSING (R) ASSY	
8	4-978-889-01	LID, BATTERY CASE	
9	4-978-891-01	TERMINAL (+), BATTERY	
10	4-978-892-01	SPRING, BATTERY COIL	
11	4-978-880-01	HANGER (R)	
12	4-978-886-01	PLATE (R), FRONT	
13	4-978-882-01	CAP (R), HANGER	
14	4-978-877-01	CAP, HEAD BAND	
15	4-956-437-01	SPRING, SLIDE	
16	X-4946-991-1	BAND ASSY, HEAD	
17	4-978-881-01	CAP (L), HANGER	
18	4-978-879-01	HANGER (L)	
19	4-978-885-01	PLATE (L), FRONT	
* 20	A-4542-349-A	ML BOARD, COMPLETE	
21	4-978-888-01	CAP, ORNAMENTAL	
22	X-4946-572-1	HOUSING (L) ASSY	
23	1-776-248-11	CORD (WITH MICRO PLUG)	
24	4-978-890-01	KNOB, SWITCH	
25	1-776-087-11	CORD (WITH PLUG) (CONVERSION) (MICRO PLUG-MINI PLUG)	
26	1-473-686-11	ADAPTOR, PLUG (DUAL)	
27	4-978-878-01	SLIDER	
28	4-980-374-01	SHEET, BLIND	
* 29	4-963-644-01	CUSHION (LOWER), SWITCH	
30	4-980-258-01	REGISTER, FRONT PLATE	
DU1	1-505-136-11	DRIVER (L)	
DU101	1-505-136-11	DRIVER (R)	
MIC1	1-542-270-11	MICROPHONE, ELECTRET CONDENSER	
MIC101	1-542-270-11	MICROPHONE, ELECTRET CONDENSER	

SECTION 6
ELECTRICAL PARTS LIST

ML **MR**

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	A-4542-349-A	ML BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C1	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C3	1-135-180-21	TANTALUM CHIP	3.3uF	20% 6.3V	
C4	1-135-201-11	TANTALUM CHIP	10uF	20% 4V	
C5	1-135-151-21	TANTALUM CHIP	4.7uF	20% 4V	
C6	1-135-201-11	TANTALUM CHIP	10uF	20% 4V	
C7	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C8	1-164-346-11	CERAMIC CHIP	1uF	16V	
C9	1-164-346-11	CERAMIC CHIP	1uF	16V	
C10	1-104-847-11	TANTAL. CHIP	22uF	20% 4V	
C11	1-104-847-11	TANTAL. CHIP	22uF	20% 4V	
C12	1-104-848-11	TANTAL. CHIP	100uF	20% 4V	
C14	1-164-344-11	CERAMIC CHIP	0.068uF	10% 25V	
C15	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C16	1-164-346-11	CERAMIC CHIP	1uF	16V	
C19	1-162-965-11	CERAMIC CHIP	0.0015uF	10% 50V	
C20	1-164-492-11	CERAMIC CHIP	0.15uF	10% 16V	
C24	1-135-151-21	TANTALUM CHIP	4.7uF	20% 4V	
C25	1-135-151-21	TANTALUM CHIP	4.7uF	20% 4V	
		< FERRITE BEAD >			
FB1	1-414-229-11	INDUCTOR, FERRITE BEAD			
FB2	1-414-229-11	INDUCTOR, FERRITE BEAD			
		< IC >			
IC1	8-759-348-89	IC TK70203M			
IC2	8-759-289-74	IC NJM2076M(TE2)			
		< TRANSISTOR >			
Q1	8-729-602-21	TRANSISTOR 2SC4154-F			
Q2	8-729-030-31	TRANSISTOR 2SA1182-0(TE85L)			
Q3	8-729-030-31	TRANSISTOR 2SA1182-0(TE85L)			
Q4	8-729-920-31	TRANSISTOR DTC343TK			
Q5	8-729-920-31	TRANSISTOR DTC343TK			
Q6	8-729-015-39	TRANSISTOR DTC323TK			
Q7	8-729-015-39	TRANSISTOR DTC323TK			
		< RESISTOR >			
R1	1-216-826-11	METAL CHIP	2.7K	5% 1/16W	
R2	1-218-700-11	METAL CHIP	2.2K	0.50% 1/16W	
R3	1-218-700-11	METAL CHIP	2.2K	0.50% 1/16W	
R4	1-216-841-11	METAL CHIP	47K	5% 1/16W	
R5	1-216-853-11	METAL CHIP	470K	5% 1/16W	
R8	1-216-825-11	METAL CHIP	2.2K	5% 1/16W	
R9	1-216-856-11	METAL CHIP	820K	5% 1/16W	
R10	1-216-789-11	METAL CHIP	2.2	5% 1/16W	
R11	1-216-789-11	METAL CHIP	2.2	5% 1/16W	
R12	1-216-789-11	METAL CHIP	2.2	5% 1/16W	
R13	1-216-789-11	METAL CHIP	2.2	5% 1/16W	
R14	1-216-793-11	METAL GLAZE	4.7	5% 1/16W	
R15	1-216-793-11	METAL GLAZE	4.7	5% 1/16W	
R17	1-216-820-11	METAL CHIP	820	5% 1/16W	
R18	1-216-814-11	METAL CHIP	270	5% 1/16W	
R19	1-216-823-11	METAL CHIP	1.5K	5% 1/16W	
R20	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R22	1-216-835-11	METAL CHIP	15K	5% 1/16W	
R23	1-216-802-11	METAL GLAZE	27	5% 1/16W	
R24	1-216-805-11	METAL CHIP	47	5% 1/16W	
R25	1-216-805-11	METAL CHIP	47	5% 1/16W	
R26	1-216-809-11	METAL CHIP	100	5% 1/16W	
		< VARIABLE RESISTOR >			
RV1	1-241-393-21	RES, ADJ, METAL GLAZE 2.2K			
RV2	1-241-395-11	RES, ADJ, METAL GLAZE 10K			
**********					
*	A-4542-350-A	MR BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C103	1-135-180-21	TANTALUM CHIP	3.3uF	20% 6.3V	

MR

Ref. No.	Part No.	Description			Remark
C104	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C105	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C106	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C107	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C108	1-164-346-11	CERAMIC CHIP	1uF		16V
C109	1-164-346-11	CERAMIC CHIP	1uF		16V
C110	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C111	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C112	1-104-848-11	TANTAL. CHIP	100uF	20%	4V
C114	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C115	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C116	1-164-346-11	CERAMIC CHIP	1uF		16V
C119	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C120	1-164-492-11	CERAMIC CHIP	0.15uF	10%	16V
C124	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C125	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C201	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C202	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C203	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
		< DIODE >			
D201	8-719-023-84	LED HLMP-1801 (POWER)			
		< FERRITE BEAD >			
FB101	1-414-229-11	INDUCTOR, FERRITE BEAD			
FB102	1-414-229-11	INDUCTOR, FERRITE BEAD			
		< IC >			
IC101	8-759-348-89	IC TK70203M			
IC102	8-759-289-74	IC NJM2076M(TE2)			
		< CHIP CONDUCTOR >			
JC101	1-216-295-00	CONDUCTOR, CHIP (2012)			
		< TRANSISTOR >			
Q101	8-729-602-21	TRANSISTOR 2SC4154-F			
Q102	8-729-030-31	TRANSISTOR 2SA1182-0(TE85L)			
Q103	8-729-030-31	TRANSISTOR 2SA1182-0(TE85L)			
Q104	8-729-920-31	TRANSISTOR DTC343TK			
Q105	8-729-920-31	TRANSISTOR DTC343TK			
Q106	8-729-015-39	TRANSISTOR DTC323TK			
Q107	8-729-015-39	TRANSISTOR DTC323TK			
Q201	8-729-402-13	TRANSISTOR XN1501			
Q202	8-729-425-89	TRANSISTOR XP1115			
		< RESISTOR >			
R101	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R102	1-218-700-11	METAL CHIP	2.2K	0.50%	1/16W
R103	1-218-700-11	METAL CHIP	2.2K	0.50%	1/16W
R104	1-216-841-11	METAL CHIP	47K	5%	1/16W
R105	1-216-853-11	METAL CHIP	470K	5%	1/16W
R108	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R109	1-216-856-11	METAL CHIP	820K	5%	1/16W
R110	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R111	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R112	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R113	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R114	1-216-793-11	METAL GLAZE	4.7	5%	1/16W
R115	1-216-793-11	METAL GLAZE	4.7	5%	1/16W
R117	1-216-820-11	METAL CHIP	820	5%	1/16W
R118	1-216-814-11	METAL CHIP	270	5%	1/16W
R119	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R120	1-216-821-11	METAL CHIP	1K	5%	1/16W
R122	1-216-835-11	METAL CHIP	15K	5%	1/16W
R123	1-216-802-11	METAL GLAZE	27	5%	1/16W
R124	1-216-805-11	METAL CHIP	47	5%	1/16W
R125	1-216-805-11	METAL CHIP	47	5%	1/16W
R126	1-216-809-11	METAL CHIP	100	5%	1/16W
R201	1-216-833-11	METAL CHIP	10K	5%	1/16W
R202	1-216-833-11	METAL CHIP	10K	5%	1/16W
R203	1-216-833-11	METAL CHIP	10K	5%	1/16W
R204	1-216-809-11	METAL CHIP	100	5%	1/16W
R205	1-216-821-11	METAL CHIP	1K	5%	1/16W
		< VARIABLE RESISTOR >			
RV101	1-241-393-21	RES, ADJ, METAL GLAZE 2.2K			
RV102	1-241-395-11	RES, ADJ, METAL GLAZE 10K			
		< SWITCH >			
SW201	1-692-397-21	SWITCH, SLIDE (POWER)			
		MISCELLANEOUS			
23	1-776-248-11	CORD (WITH MICRO PLUG)			
DU1	1-505-136-11	DRIVER (L)			
DU101	1-505-136-11	DRIVER (R)			
MIC1	1-542-270-11	MICROPHONE, ELECTRET CONDENSER			
MIC101	1-542-270-11	MICROPHONE, ELECTRET CONDENSER			

Ref. No.	Part No.	Description	Remark

ACCESSORIES & PACKING MATERIALS
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	1-473-686-11	ADAPTOR, PLUG (DUAL)
	1-776-087-11	CORD (WITH PLUG) (CONVERSION) (MICRO PLUG-MINI PLUG)
	3-810-317-11	MANUAL, INSTRUCTION (ENGLISH, SPANISH)
	3-810-317-21	MANUAL, INSTRUCTION (FRENCH, GERMAN) (Canadian, AEP, UK)
	3-810-317-31	MANUAL, INSTRUCTION (ITALIAN, PORTUGUESE) (AEP, UK)

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HARDWARE LIST
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#1	7-685-102-19	SCREW +P 2X4 TYPE2 NON-SLIT
#2	7-685-105-19	SCREW +P 2X8 TYPE2 NON-SLIT
#3	7-685-103-19	SCREW +P 2X5 TYPE2 NON-SLIT
#4	7-685-104-19	SCREW +P 2X6 TYPE2 NON-SLIT

9-960-449-11

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